

US009638253B2

# (12) United States Patent

# Berens et al.

#### (54) **BEARING**

(71) Applicants: Frank Berens, Saunay (FR); Laurent Varnoux, Saint Avertin (FR); Xiaobo Zhou, Houten (NL)

(72) Inventors: Frank Berens, Saunay (FR); Laurent Varnoux, Saint Avertin (FR); Xiaobo

Zhou, Houten (NL)

(73) Assignee: **AKTIEBOLAGET SKF**, Gothenburg

(SE)

(\*) Notice: Subject to any disclaimer, the term of this

patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **14/830,871** 

(22) Filed: Aug. 20, 2015

(65) Prior Publication Data

US 2016/0061264 A1 Mar. 3, 2016

(30) Foreign Application Priority Data

Aug. 28, 2014 (GB) ...... 1415195.5

(51) Int. Cl.

F16C 19/00 (2006.01) F16C 33/78 (2006.01) F16C 33/66 (2006.01) F16C 33/82 (2006.01)

(Continued)

(52) U.S. Cl.

CPC ....... F16C 33/7846 (2013.01); F16C 33/585 (2013.01); F16C 33/6614 (2013.01); F16C 33/785 (2013.01); F16C 33/7823 (2013.01); F16C 33/7826 (2013.01); F16C 33/7826 (2013.01); F16C 33/7863 (2013.01); F16C 33/7863 (2013.01); F16C 33/7863 (2013.01); F16C 33/82 (2013.01); F16C 19/163 (2013.01); (Continued)

# (10) Patent No.: US 9,638,253 B2

(45) **Date of Patent:** 

May 2, 2017

## (58) Field of Classification Search

CPC ....... F16C 33/6603; F16C 33/7803; F16C 33/7806; F16C 33/7809; F16C 33/7813; F16C 33/782; F16C 33/7826; F16C 33/784; F16C 33/7843; F16C 33/7846; F16C 33/785

See application file for complete search history.

# (56) References Cited

#### U.S. PATENT DOCUMENTS

6,179,472	B1*	1/2001	Gilliland	F16C 33/80
				384/477
6,490,137	B1 *	12/2002	Toyota	
				360/135
7,547,466	B2 *	6/2009	Misu	F16C 33/74
				384/93

### FOREIGN PATENT DOCUMENTS

CN 201193650 Y 2/2009 EP 1239173 A2 9/2002 (Continued)

Primary Examiner — James Pilkington (74) Attorney, Agent, or Firm — Bryan Peckjian; SKF USA Inc. Patent Dept.

## (57) ABSTRACT

A rolling element bearing comprising inner and outer rings; a plurality of rolling elements disposed between opposing surfaces of the inner and outer rings; and a bearing shield comprising a first member having an annular surface facing the plurality of rolling elements, the first member either (1) extending from the inner ring towards the outer ring (defining a gap between the first member and the outer ring) and the inner ring having a low surface energy surface adjacent the gap, or (2) extending from the outer ring towards the inner ring (defining a gap between the first member and the inner ring) and the inner ring comprises a low energy surface adjacent the gap. The low energy surfaces each have a surface energy of ≤0.028 N/m.

# 7 Claims, 3 Drawing Sheets

